

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An image sensing apparatus which comprises an image sensing element and can exchange a lens, comprising:

~~a storage~~ an extraction ~~device for storing shading correction coefficients respectively corresponding to pixels in a two-dimensional matrix on a plane of the image sensing element adapted to extract information concerning the lens which is held in the lens; and~~

~~a correction device for making a correction calculation of pixel data read out from each pixel of~~ adapted to correct an image data from the image sensing element by extracting the shading correction coefficient associated with the corresponding pixel from the shading correction coefficients stored in said storage device using a first correction data which has a correction component of a first direction which is one of two orthogonal directions in a surface of the image sensing element, and a second correction data which has a correction component of a second direction which is the other one of the two orthogonal directions in the surface of the image sensing element,

~~wherein said storage device stores the shading correction coefficients while classifying the shading correction coefficients into components in two orthogonal directions on the plane of the image sensing element, and~~

~~said correction device extracts two shading correction coefficients from the shading correction coefficients stored in said storage device in accordance with addresses of the corresponding pixel in the two directions, and multiplies the pixel data read out from the~~

~~corresponding pixel by the two extracted shading correction coefficients in turn to correct the pixel data~~ the first correction data and the second correction data are data which are based on the information concerning the lens extracted by said extraction device.

2. (Currently Amended) The apparatus according to claim 1, further comprising:
~~an extraction device for extracting exit pupil position information stored in the lens; and~~
a calculation device ~~for calculating shading correction coefficients~~ adapted to calculate the first correction data and the second correction data on the basis of the ~~exit pupil position~~ information extracted by said extraction device, ~~and sending the shading correction coefficients to said storage device~~

wherein the information extracted by said extraction device is an exit pupil position information.

3. (Currently Amended) The apparatus according to claim 2, wherein said calculation device calculates the ~~shading correction coefficients~~ first correction data and the second correction data, on the basis of the exit pupil position information extracted by said extraction device, and an image height of a corresponding pixel.

4. (Original) The apparatus according to claim 3, further comprising:
a correction device for correcting the exit pupil position information extracted by said extraction device in accordance with at least one of a zoom position, focus position, image height, and aperture value of the lens, and sending the corrected exit pupil position information to said calculation device.

5. (Original) The apparatus according to claim 3, wherein the exit pupil position information is information that represents a distance between the lens and the image sensing element on an optical axis.

6. (Original) The apparatus according to claim 3, wherein the image height is a distance between a position of a pixel of interest and a point on an optical axis on the plane of the image sensing element.

7. (Original) An image sensing apparatus which comprises an image sensing element and can exchange a lens, comprising:

a storage device for storing shading correction coefficients respectively corresponding to pixels of the image sensing element; and

a correction device for making a correction calculation of pixel data read out from each pixel of the image sensing element by extracting the shading correction coefficient associated with the corresponding pixel from the shading correction coefficients stored in said storage device,

wherein said correction device independently corrects pixels which are influenced by a color filter, which does not transmit a specific wavelength range and is inserted between the lens and the image sensing element, and pixels which are not influenced by the color filter, on the basis of shading correction coefficients stored in said storage device.

8. (Original) The apparatus according to claim 7, further comprising:

an extraction device for extracting exit pupil position information stored in the lens; and
a calculation device for calculating shading correction coefficients on the basis of the exit pupil position information extracted by said extraction device, and sending the shading correction coefficients to said storage device.

9. (Original) The apparatus according to claim 8, wherein said calculation device calculates the shading correction coefficients on the basis of the exit pupil position information extracted by said extraction device, and an image height of a corresponding pixel.

10. (Original) The apparatus according to claim 9, further comprising:
a correction device for correcting the exit pupil position information extracted by said extraction device in accordance with at least one of a zoom position, focus position, image height, and aperture value of the lens, and sending the corrected exit pupil position information to said calculation device.

11. (Original) The apparatus according to claim 9, wherein the exit pupil position information is information that represents a distance between the lens and the image sensing element on an optical axis.

12. (Original) The apparatus according to claim 9, wherein the image height is a distance between a position of a pixel of interest and a point on an optical axis on the plane of the image sensing element.

13. (Currently Amended) A shading correction method applied to an image sensing apparatus, which comprises an image sensing element and can exchange a lens, comprising:

~~the storage~~ extraction step of ~~storing in a storage device shading correction coefficients~~ respectively corresponding to pixels in a two-dimensional matrix on a plane of the image sensing element extracting information concerning the lens which is held in the lens; and

~~the correction step of making a correction calculation of pixel data read out from each pixel of~~ correcting an image data from the image sensing element by extracting the shading correction coefficient associated with the corresponding pixel from the shading correction coefficients stored in said storage device by using a first correction data which has a correction component of a first direction which is one of two directions in a surface of the image sensing element, and a second correction data which has a correction component of a second direction which is the other one of the two orthogonal directions in the surface of the image sensing element,

~~wherein the storage step includes the~~ first correction data and the second correction data are data which are based on the information concerning the lens extracted in the extraction step of storing in said storage device the shading correction coefficients while classifying the shading correction coefficients into components in two orthogonal directions on the plane of the image sensing element, and

~~the correction step includes the step of extracting two shading correction coefficients from the shading correction coefficients stored in said storage device in accordance with addresses of the corresponding pixel in the two directions, and multiplying the pixel data read out from the corresponding pixel by the two extracted shading correction coefficients in turn to correct the pixel data.~~

14. (Currently Amended) The method according to claim 13, further comprising:
~~the extraction step of extracting exit pupil position information stored in the lens; and~~
the calculation step of calculating ~~shading correction coefficients~~ the first correction data
and the second correction data on the basis of the ~~exit pupil position~~ information extracted in the
extraction step, ~~and sending the shading correction coefficients to said storage device~~
wherein the information extracted in the extraction step is an exit pupil position
information.

15. (Currently Amended) The method according to claim 14, wherein the calculation
step includes the step of calculating the ~~shading correction coefficients~~ first correction data and
the second correction data on the basis of the exit pupil position information extracted in the
extraction step, and an image height of a corresponding pixel.

16. (Original) The method according to claim 15, further comprising:
the correction step of correcting the exit pupil position information extracted in the
extraction step in accordance with at least one of a zoom position, focus position, image height,
and aperture value of the lens, and supplying the corrected exit pupil position information to the
calculation in the calculation step.

17. (Original) A shading correction method applied to an image sensing apparatus,
which comprises an image sensing element and can exchange a lens, comprising:
the image sensing step of obtaining pixel data from the image sensing element; and

the correction step of making a correction calculation of pixel data read out from each pixel of the image sensing element by extracting the shading correction coefficient associated with the corresponding pixel from shading correction coefficients stored in a storage device, which stores shading correction coefficients respectively corresponding to pixels of the image sensing element,

wherein the shading correction coefficients are independently stored in the storage device in correspondence with pixels which are influenced by a color filter, which does not transmit a specific wavelength range and is inserted between the lens and the image sensing element, and pixels which are not influenced by the color filter.

18. (Original) The method according to claim 17, further comprising:
the extraction step of extracting exit pupil position information stored in the lens; and
the calculation step of calculating shading correction coefficients on the basis of the exit pupil position information extracted in the extraction step, and sending the shading correction coefficients to said storage device.

19. (Original) The method according to claim 18, wherein the calculation step includes the step of calculating the shading correction coefficients on the basis of the exit pupil position information extracted in the extraction step, and an image height of a corresponding pixel.

20. (Original) The method according to claim 19, further comprising:

the correction step of correcting the exit pupil position information extracted in the extraction step in accordance with at least one of a zoom position, focus position, image height, and aperture value of the lens, and supplying the corrected exit pupil position information to the calculation in the calculation step.

21. (Original) A program for making -a- computer -implement a shading correction method cited in claim 13.

22. (Original) A storage medium for computer-readably storing a program cited in claim 21.

23. (Original) A program for making a computer implement a shading correction method cited in claim 17.

24. (Original) A storage medium for computer-readably storing a program cited in claim 23.